REMARKS

Request for Reconsideration, Informal Matters, Claims Pending

The non-final Official action mailed on 15 April 2003 has been considered carefully. Reconsideration of the claimed invention in view of the amendments above and the discussion below is respectfully requested.

The specification has been amended on page 5, lines 6-10 to correct a typographical error.

The Applicants respectfully decline to adopt the Examiner's suggestion to add the term - - and - - to Claims 3, 9, 20, and 22. The proposed amendment is one of grammatical or idiomatic preference and is not necessary to comply with 35 USC 112.

Claims 1-11 and 13-23 are pending.

Response to Objections to the Drawings & Specification

In FIG. 4, the Applicants' propose to change block "420" to read: "Obtain an Estimated Location and A Derived Altitude Based On The Coarse Altitude". Support for the proposed changes is found in the Detailed Description at page 5, line 6-10. In one embodiment, the "Derived Altitude" is obtained from a 3-dimensional position solution, and in another embodiment, for example, in the case of a 2-dimensional position solution, the derived altitude is the coarse altitude. Block "460" in FIG. 4 has been amended as

suggested by the Examiner. A marked-up copy of the FIG. 4 is attached for consideration by the Examiner.

Response to Rejection Under 35 USC 112, 1st para.

The Examiner questions how one obtains a "derived altitude", noting that the Detailed Description on page 5, lines 6-10 indicates merely that the "derived altitude" is the same as the "coarse altitude" when only a 2-dimensional solution is available, since a 2-dimensional solution may not include an altitude component. The Detailed Description also indicates on page 5, lines 6-10, in one embodiment, that the "derived altitude" corresponds to an altitude component of a 3-dimensional position solution. Thus the Detailed Description teaches at least two different methods for obtaining a "derived altitude". The Examiner apparently recognizes (on page 2, para. 4 of the instant Office Action dated 15 April 2003) that 3-dimensional position solutions include an altitude component. Kindly withdraw the objection under 35 USC 112, 1st para.

Response to Rejection Under 35 USC 112, 2nd para.

Claim 9, dependent from Claim 6, recites "a 3-dimensional estimated location". The Examiner contends that it is unclear whether the "3-dimensional estimated location" of Claim 9 is the same as the "estimated

location" of Claim 6. Based upon rudimentary claim construction principals, it is clear on the face of the claims that the " 3-dimensional estimated location" of Claim 9 is generally different than the 'estimated location" of Claim 6, since separate antecedent bases are provided for both limitations. The "3-dimensional estimated location" and the "estimated location" provided corresponding bases to determine "derived" and "reference" altitudes, respectively, which are the subject of the conditional limitation of Claim 9. Thus Claim 9 is not irreconcilably ambiguous or indefinite. Kindly withdraw the objection under 35 USC 112, 2nd para.

Regarding Claim 11, the Examiner misconstrues the limitation at issue. Contrary to the Examiner's assertion, Claim 11 does not recite a "3-dimensional location". Claim 11 recites that the reference altitude of the receiver s based upon "3-dimensional location fix altitude information", which in one embodiment is the altitude component of a 3-dimensional location fix. Thus Claim 11 is not irreconcilably ambiguous or indefinite. Kindly withdraw the objection under 35 USC 112, 2nd para.

Allowability of Claims Over Fernandez-Corbaton

Claims 6 and 10-11 stand rejected under 35 U.S.C. 102(e) for anticipation by US 6,289,280 (Fernandez-Corbaton). The Examiner contends, in the 'Response to Arguments' that Fernandez-Corbaton "... linearizes a first altitude to produce a second altitude, the linearized altitude, which is the reference altitude ..." and that Fernandez-Corbaton "... then determines a new

location of the receiver based upon the reference altitude (column 7, lines 44-47)." Office Action, 14 April 2003, para. 26.

Claim 7 stands rejected under 35 U.S.C. 103 as being unpatentably over US 6,289,280 (Fernandez-Corbaton).

Discussion of Patentability of Independent Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, Fernandez-Corbaton does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

Fernandez-Corbaton explicitly discloses a non-iterative algorithm for determining the location of a cellular telephone. Fernandez-Corbaton, col. 5, lines 46-51. The Examiner's assertion that Fernandez-Corbaton "... linearinzes the first altitude to produce a second altitude, ... which is the reference altitude..." is incorrect. Fernandez-Corbaton discloses at column 6, lines 54 to column 7, line 23:

> ... linearizing satellite and altitude measurements around an initial estimate of the user position. Linearizing the satellite and altitude measurements means removing terms that are squared (i.e., raised to a power of two).

The linearizing step in Fernandez-Corbaton is not the same as producing a second altitude as asserted by the Examiner. Thus, Fernandez-Corbaton does not determine "... a reference altitude of the receiver based upon the estimated location of the receiver..." as recited in Claim 6. Moreover, Fernandez-Corbaton does not determine "... a new location of the receiver based upon the reference altitude" as recited in Claim 6. Clam 6 and the claims that depend therefrom are thus patentably distinguished over Fernandez-Corbaton.

Discussion of Patentability of Claim 7

Regarding Claim 7, dependent from Claim 6, Fernandez-Corbaton does not disclose or suggest "... determining the reference altitude of the receiver by using the estimated location to index the reference altitude in a map database" in combination with the limitations of Claim 6. Moreover, Fernandez makes no reference to performing these operations "... in a satellite positioning system receiver...." Claim 7 is thus further patentably distinguished over Fernandez-Corbaton.

Discussion of Patentability of Claim 10

Regarding Claim 10, dependent from Claim 6, Fernandez-Corbaton does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> ... determining the new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location."

Fernandez-Corbaton merely uses terrain information to estimate an altitude equation. Fernandez-Corbaton, col. 8, lines 52-61. In Fernandez-Corbaton, the altitude information is linearized using the estimated location as discussed above. Fernandez-Corbaton, col. 6, lines 54-58. Thus, Fernandez-Corbaton does not determine the "...new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location." Instead, Fernandez-Corbaton uses terrain slope to estimate altitude. Claim 10 is thus further patentably distinguished over Fernandez-Corbaton.

Discussion of Patentability of Claim 11

Regarding Claim 11, dependent from Claim 6, Fernandez-Corbaton does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> ... determining the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information.

As noted, Fernandez-Corbaton linearizes an estimated altitude around an initial estimate of the user's position. This is not the same as determining a reference altitude based upon an estimated location of the receiver. Claim 11 is thus further patentably distinguished over Fernandez-Corbaton.

Allowability of Claims Over Nelson

Claims 6 and 11 stand rejected under 35 U.S.C. 102(e) for anticipation by US 5,890,090 (Nelson).

Discussion of Patentability of Independent Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, Nelson does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

Nelson discloses using known or assumed altitude information to determine location when only three satellites are visible. Nelson, col. 3, lines 9-14. In Nelson, the altitude information is obtained from an aircraft altimeter or based on a ship waterline. Where no altitude measurement is available, Nelson uses an old altitude measurement. Nelson, col. 3, lines 15-22. Claim 6 and the claims that depend therefrom are thus patentably distinguished over Nelson.

Discussion of Patentability of Claim 11

Regarding Claim 11, dependent from Claim 6, Nelson does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> ... determining the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information.

As noted, Nelson uses a measured or old altitude measurement to supplement a location computation where only three satellites are available. Claim 11 is thus further patentably distinguished over Nelson.

Allowability of Claims Over Compact GPS Product Overview

Claims 6 and 11 stand rejected under 35 U.S.C. 102(b) for anticipation by the Compact GPS Product Overview product brochure publication (Compact GPS).

Discussion of Patentability of Claims 6 & 11

Regarding Claim 6, contrary to the Examiner's assertion, Compact GPS does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;

determining a new location of the receiver based upon the reference altitude.

Regarding Claim 11, dependent from Claim 6, Nelson does not disclose or suggest a "... method in a satellite positioning system receiver..." including

... determining the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information.

The Compact GPS product brochure, on page 2, merely provides a list of product features. The Examiner's assertion that the statement "Automatic *altitude* hold mode from three-dimensional to two-dimensional navigation" in the Compact GPS reference supports the anticipation rejection is unreasonable. The subject statement on its face does not does anticipate the limitations of Claims 6 and/or 11. The rejection under 35 USC 102(b) must therefore be withdrawn. Claims 6 and 11 are thus patenably distinguished over Compact GPS.

Allowability of Claims Over Odagawa

Claims 6-11, 13-14 and 22 stand rejected under 35 U.S.C. 102(b) for anticipation by US 5,087,919 (Odagawa).

Discussion of Patentability of Independent Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, Odagawa does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

In FIG. 4A of Odagawa, at blocks S50 & S54, Odagawa determines elevation based on a landmark or road segment coordinate data and based on corresponding 2 dimensional position data. Odagawa, col. 8, lines 60-65, col. 9, lines 30-35 & 58-63. Also, Odagawa does not communicate with a wireless communications network. Claim 6 and the claims that depend therefrom are thus patenably distinguished over Odagawa.

Discussion of Patentability of Claim 7

Regarding Claim 7, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest "... determining the reference altitude of the receiver by using the estimated location to index the reference altitude in a map database" in combination with the limitations of Claim 6. In blocks S50 and S54, Odagawa obtains the elevation value from either the landmark point or road segment coordinate data and based on 2 dimensional measurement data. Odagawa, col. 9, lines 30-35 & 58-63. Odagawa does not use estimated

location to "index the reference altitude in a map database." Claim 7 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 8

Regarding Claim 8, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest determining the "... estimated location of the receiver based upon a coarse altitude of the receiver" in combination with the limitations of Claim 6. Odagawa obtains the estimated location from 2 dimensional measurement data. Odagawa, col. 9, lines 30-35 & 58-63. Claim 8 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 9

Regarding Claim 9, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest determining a

> ... derived altitude from a 3-dimensional estimated location of the receiver, determining the new location of the receiver if a difference between the derived altitude and the reference altitude of the receiver is outside an altitude threshold

in combination with the limitations of Claim 6. The comparison in Odagawa referenced by the Examiner refers to the distance between intersecting roads and an estimated position. Odagawa, col. 10, lines 25-46, FIG. 4B. Claim 9 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 10

Regarding Claim 10, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest determining the "... new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location" in combination with the limitations of Claim 6. Odagawa make no reference to terrain slope or the use thereof. Claim 10 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 11

Regarding Claim 11, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest determining "... the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information" in combination with the limitations of Claim 6. Odagawa determines the reference altitude based on 2 dimensional position measurement data. Odagawa, col. 9, lines 30-35 & 58-63. Claim 11 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 22

Regarding Claim 22, contrary to the Examiner's assertion, Odagawa fails to disclose or suggest "... computing a derived altitude from the 3-dimensional location, determining the reference altitude of the receiver from the derived altitude" in combination with the limitations of Claim 6. Odagawa does not compute a derived altitude. Claim 22 is thus further patentably distinguished over Odagawa.

Allowability of Claims Over Okude

Claims 6-11, 13-14 and 22 stand rejected under 35 U.S.C. 102(e) for anticipation by US 6,157,342 (Okude).

Discussion of Patentability of Independent Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, Okude does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

Okude is concerned with superposing the current position of a vehicle on a map image. Okude, col. 2, lines 32-42. Okude corrects 2-dimensional position data based on map data in the vicinity of a position computation and based on a correlation of a traveling locus of the vehicle and the road. Okude, col. 9, lines 7-29. Okude does not communicate with a wireless communications network. Claim 6 is thus patentably distinguished over Okude.

Discussion of Patentability of Claim 7

Regarding Claim 7, contrary to the Examiner's assertion, Okude fails to disclose or suggest "... determining the reference altitude of the receiver by using the estimated location to index the reference altitude in a map database" in combination with the limitations of Claim 6. Okude calculates height by interpolation between height information provided from a database. Okude, col. 9, lines 18-58. Claim 7 is thus further patentably distinguished over Okude.

Discussion of Patentability of Claim 10

Regarding Claim 10, contrary to the Examiner's assertion, Okude fails to disclose or suggest determining the "... new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location" in combination with the limitations of Claim 6. Claim 10 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 11

Regarding Claim 11, contrary to the Examiner's assertion, Okude fails to disclose or suggest determining "... the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information" in combination with the limitations of Claim 6. Okude corrects 2-dimensional position data based on map data in the vicinity of a position computation and based on a correlation of a traveling locus of the vehicle and the road. Okude, col. 9, lines 7-17. Claim 11 is thus further patentably distinguished over Odagawa.

Discussion of Patentability of Claim 22

Regarding Claim 22, contrary to the Examiner's assertion, Okude fails to disclose or suggest determining "... computing a derived altitude from the 3-dimensional location, determining the reference altitude of the receiver from the derived altitude" in combination with the limitations of Claim 6. Okude obtains height information by interpolation. Claim 22 is thus further patentably distinguished over Odagawa.

Allowability of Claims Over van Diggelen

Claims 1, 3, 5-7, 9-11, 15-16 and 19-21 stand rejected under 35 U.S.C. 102(e) for anticipation by US 6,429,814 (van Diggelen).

Discussion of Patentability of Independent Claim 1

Regarding Claim 1, contrary to the Examiner's assertion, van Diggelen does not disclose or suggest a "...method in a satellite positioning system receiver, comprising

> ... determining an estimated location of the receiver at the receiver;
> transmitting the estimated location to a network;
> receiving from the network altitude information based upon the estimated location of the receiver;
> determining a new location of the receiver at the receiver based upon the altitude information received from the network.

van Diggelen does not transmit estimated location to a network. In FIGs. 8 & 9, van Diggelen discloses performing position computation at a remote processing station, wherein the mobile receiver transmits pseudorange information to the reference station. van Diggelen, col. 7, lines 55-63 & col. 8, lines 5-13. A pseduorange is an estimate of distance between the mobile GPS receiver and a satellite. van Diggelen, col. 3, lines 15-18. Claim 1 and the claims that depend therefrom are thus patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 3

Regarding Claim 3, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest "... determining a derived altitude based upon the estimated location of the receiver, the altitude information from the network including a reference altitude, determining the new location of the receiver if a difference between the derived and reference altitudes is outside an altitude threshold" in combination with the limitations of Claim 1. Van Diggelen does not obtain altitude information from a network. The reference station in van Diggelen sends only the position computation to the mobile receiver. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Claim 3 is thus patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 5

Regarding Claim 5, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest "... receiving at the receiver terrain slope estimates at the estimated location from the network, determining the new location at the receiver based upon the altitude information and terrain slope estimates received from the network" in combination with the limitations of Claim 1. Van Diggelen does not obtain terrain slope information from a network. The reference station in van Diggelen provides only position computation information to the mobile receiver. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Claim 5 is thus patentably distinguished over van Diggelen.

Discussion of Patentability of Independent Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, van Diggelen does not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

van Diggelen discloses computing a 3-dimensional position solution using only three pseudorange measurements, van Diggelen, col. 3, lines 18-20, and altitude information obtained as an average of a range of altitudes including a point above the earth's surface and a point below the

surface. van Diggelen, col. 4, lines 17-23 & lines 36-46. van Diggelen also discloses, in FIGs. 8 & 9, performing the positioning computation at a remote processing station, wherein the mobile receiver transmits pseudorange information to the reference station. van Diggelen, col. 7, lines 55-63 & col. 8, lines 5-13. Claim 6 and the claims that depend therefrom are thus patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 7

Regarding Claim 7, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest "... determining the reference altitude of the receiver by using the estimated location to index the reference altitude in a map database" in combination with the limitations of Claim 6. Claim 7 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 9

Regarding Claim 9, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest "... determining a derived altitude from a 3-dimensional estimated location of the receiver, determining the new location of the receiver if a difference between the derived altitude and the reference altitude of the receiver is outside an altitude threshold" in combination with the limitations of Claim 6. There is no indication the van Diggelen compares a reference altitude with an altitude derived from a 3 dimensional solution. Claim 9 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 10

Regarding Claim 10, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining the "... new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location" in combination with the limitations of Claim 6. There is no discussion of terrain slope in van Diggelen. The model altitude model in van Diggelen is based on geoid and ellipsoid altitude models. Claim 10 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 11

Regarding Claim 11, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining "... the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information" in combination with the limitations of Claim 6. van Diggelen does not specifically indicate how the altitude range is selected, only that the range must include points above and below the earth's surface. Van Diggelen, col. 9, lines 7-17. Claim 11 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Independent Claim 15

Regarding Claim 15, contrary to the Examiner's assertion, van Diggelen does not disclose or suggest a "... satellite positioning system receiver location method, comprising

... determining, at the receiver, an estimated location of the receiver;

transmitting the estimated location of the receiver to a network;

determining a reference altitude of the receiver at the network based upon the estimated location of the receiver;

determining a new location of the receiver based upon the reference altitude of the receiver.

van Diggelen transmits only pseudorange information to a reference receiver. van Diggeleln, col. 7, lines 57-67 & col. 8, lines 5-16. van Diggelen does not transmit an estimated location from the mobile device to the network. Claim 15 and the claims that depend therefrom are thus patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 16

Regarding Claim 16, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining "... the reference altitude of the receiver by using the estimated location to index the reference altitude of the receiver in a map database on the network" in combination with Claim 15. van Diggelen does not index a reference altitude. Instead, van Diggelen computes an average based upon a range having on altitudes above and below the earth's surface. Claim 16 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 19

Regarding Claim 19, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining "... determining the new location of the receiver at the network" in combination with Claim 15 and any intervening claims. Claim 19 depends from Claim 18, which the Examiner has not rejected using van Diggelen. Claim 18 recites that a location determination is made only if a difference between coarse and the reference altitude satisfies a condition. van Diggelen does not compute such a difference. Claims 18-19 are thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 20

Regarding Claim 20, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining

> ... the estimated location is a 3-dimensional location fix, determining a derived altitude from the estimated location,
>
> transmitting satellite information used to determine the 3-dimensional location fix of the receiver to the network, determining a difference between the derived altitude and the reference altitude, determining a corrected location of the receiver based upon the satellite information and the difference

in combination with Claim 15. van Diggelen does not send a 3 dimensional location fix to the network. Van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Claim 20 is thus further patentably distinguished over van Diggelen.

Discussion of Patentability of Claim 21

Regarding Claim 21, contrary to the Examiner's assertion, van Diggelen fails to disclose or suggest determining

> ... transmitting weighting factors used to determine the estimated location of the receiver to the network, determining a corrected location of the receiver based upon the satellite information, the weighting factors, and the difference between the derived altitude and the reference altitude at the network

in combination with Claim 15 and any intervening claims. van Diggelen does not send weighting factor information to the network. Van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Claim 21 is thus further patentably distinguished over van Diggelen.

Allowability of Claims Over Sheynblat & Krasner

Summary of Examiner's Rejection

Claims 6-7 and 10-11 stand rejected under 35 U.S.C. 102 for anticipation by US 6,061,018 (Sheynblat) in view of US 5,841,396 (Krasner). The Examiner contends that it would have been obvious to "... adapt[Sheynblat] to allow receiver only positioning, without the requirement of being connected to a wireless network..." based on Krasner. Office Action, 15 April 2003, para. 19.

Discussion of Patentability of Claim 6

Regarding Claim 6, contrary to the Examiner's assertion, Sheynblat and Krasner do not disclose or suggest a "... method in a satellite positioning system receiver..." including

> determining an estimated location of the receiver based on information received from a wireless communications network;
> determining a reference altitude of the receiver based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude.

Sheynblat discloses computation of GPS receiver location at a GPS server based upon satellite measurements (pseudoranges) provided by a GPS receiver and based upon cell site information. Sheynblat, col. 9, lines 16-49. The Examiner relies upon Krasner for teaching the determination of location without assistance from the network. Krasner nevertheless discusses transmitting only almanac and time stamp information to the GPS receiver. Krasner, col. 15, lines 56-63. Claim 6 and the claims that depend therefrom are therefore further patentably distinguished over Sheynblatt and Krasner.

Discussion of Patentability of Claim 7

Regarding Claim 7, contrary to the Examiner's assertion, Sheynblat and Krasner fail to disclose or suggest "... determining the reference altitude of the receiver by using the estimated location to index the reference altitude in a map database" in a receiver. Sheyblat determines location at the

network based on the altitude of the cell site and based upon pseudorange information provided by the GPS receiver. Krasner discusses transmitting only almanac and time stamp information to the GPS receiver. Krasner, col. 15, lines 56-63. Claim 7 is therefore further patentably distinguished over Sheynblatt and Krasner.

Discussion of Patentability of Claim 10

Regarding Claim 10, contrary to the Examiner's assertion, Sheynbat and Kranser fail to disclose or suggest determining the "... new location at the receiver based upon the reference altitude of the receiver and terrain slope information for the estimated location" in combination with the limitations of Claim 6. There is no discussion of terrain slope in Sheynbat or Kranser. Claim 10 is thus further patentably distinguished over Sheynbat and Kranser.

Discussion of Patentability of Claim 11

Regarding Claim 11, contrary to the Examiner's assertion, Sheynbat and Kranser fail to disclose or suggest determining "... the reference altitude of the receiver based upon the estimated location of the receiver and based upon 3-dimensional location fix altitude information" in combination with the limitations of Claim 6. Claim 11 is thus further patentably distinguished over Sheynbat and Kranser.

Allowability of Claims Over Fernandez-Corbaton, Okude & van Diggelen

Summary of Examiner's Rejection

Claims 1, 5, 15, 16 & 19-21 stand rejected under 35 U.S.C. 103(a) as being unpatentably over Fernandez-Corbaton in view of van Diggelen. Alternatively, Claims 1, 5, 15, 16 & 19-21 stand rejected under 35 U.S.C. 103(a) as being unpatentably over Okude in view of van Diggelen.

The Examiner's asserts that van Diggelen discloses transmitting estimated location form the GPS receiver to the network, and the Examiner concludes that it would have been obvious "... for the receiver to be able to access the terrain model over a network in order to reduce the amount of storage space in the receiver... and in order to provide real time altitude data...." Office Action, 14 April 2003, paras. 21 & 25.

Discussion of Patentability of Independent Claim 1

Regarding Claim 1, contrary to the Examiner's assertion, Fernandez-Corbaton or Okude and van Diggelen do not disclose or suggest a "...method in a satellite positioning system receiver, comprising

> ... determining an estimated location of the receiver at the receiver;
> transmitting the estimated location to a network;
> receiving from the network altitude information based upon the estimated location of the receiver;
> determining a new location of the receiver at the receiver based upon the altitude information received from the network.

The Examiner's rejection is based on the erroneous conclusions that van Diggelen discloses transmitting estimated location form the GPS receiver to the network. As noted above, van Diggelen does not transmit estimated location to a network. In FIGs. 8 & 9, van Diggelen discloses transmitting only pseudorange information to a reference station, which performs position computation. van Diggelen, col. 7, lines 55-63 & col. 8, lines 5-13. The GPS receiver of Fernandez-Corbaton and Okude do not receive altitude information from a network in response to sending estimated location information thereto. Claim 1 and the claims that depend therefrom are thus patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen.

Discussion of Patentability of Claim 5

Regarding Claim 5, contrary to the Examiner's assertion, Fernandez-Corbaton, Okude and van Diggelen fail to disclose or suggest "... receiving at the receiver terrain slope estimates at the estimated location from the network, determining the new location at the receiver based upon the altitude information and terrain slope estimates received from the network" in combination with the limitations of Claim 1. Fernandez-Corbaton, Okude and Van Diggelen do not obtain terrain slope information from a network. The reference station in van Diggelen provides only position fix information to the mobile receiver. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Claim 5 is thus patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen

Discussion of Patentability of Independent Claim 15

Regarding Claim 15, contrary to the Examiner's assertion, Fernandez-Corbaton, Okude and van Diggelen do not disclose or suggest a "... satellite positioning system receiver location method, comprising

> ... determining, at the receiver, an estimated location of the receiver;
> transmitting the estimated location of the receiver to a network;
> determining a reference altitude of the receiver at the network based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude of the receiver.

Fernandez-Corbaton, Okude and van Diggelen do not transmit an estimated location from the mobile device to the network. van Diggelen transmits only pseudorange information to a reference receiver. van Diggeleln, col. 7, lines 57-67 & col. 8, lines 5-16. Claim 15 and the claims that depend therefrom are thus patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen.

Discussion of Patentability of Claim 16

Regarding Claim 16, contrary to the Examiner's assertion, Fernandez-Corbaton, Okude and van Diggelen fail to disclose or suggest determining "... the reference altitude of the receiver by using the estimated location to index the reference altitude of the receiver in a map database on the network" in combination with Claim 15. van Diggelen does not index a

reference altitude. Instead, van Diggelen computes an average based upon a range having on altitudes above and below the earth's surface. Fernandex-Corbaton does not discuss indexing. Okude does not communicate with a network. Claim 16 is thus further patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen.

Discussion of Patentability of Claim 19

Regarding Claim 19, contrary to the Examiner's assertion, Fernandez-Corbaton, Okude and van Diggelen fails to disclose or suggest determining "... determining the new location of the receiver at the network" in combination with Claim 15 and any intervening claims. Claim 19 depends from Claim 18, which the Examiner has not rejected based on Fernandez-Corbaton and van Diggelen. Claim 18 recites that a location determination is made only if a difference between coarse and the reference altitude satisfies a condition. Fernandez-Corbaton and van Diggelen do not compute such a difference. Okude does not communicate with a network. Claims 18-19 are thus further patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen.

Discussion of Patentability of Claim 20

Regarding Claim 20, contrary to the Examiner's assertion, Fernandez-Corbaton and van Diggelen fail to disclose or suggest determining

> ... the estimated location is a 3-dimensional location fix, determining a derived altitude from the estimated location,

> transmitting satellite information used to determine the 3-dimensional location fix of the receiver to the network, determining a difference between the derived altitude and the reference altitude, determining a corrected location of the receiver based upon the satellite information and the difference

in combination with Claim 15. Fernandez-Corbaton, Okude and van Diggelen do not send a 3 dimensional location fix to the network. Van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Okude does not communicate with a network. Claim 20 is thus further patentably distinguished over Fernandez-Corbaton or Okude in combination with van Diggelen.

Discussion of Patentability of Claim 21

Regarding Claim 21, contrary to the Examiner's assertion, Fernandez-Corbaton, Okude and van Diggelen fails to disclose or suggest determining

> ... transmitting weighting factors used to determine the estimated location of the receiver to the network, determining a corrected location of the receiver based upon the satellite information, the weighting factors, and the difference between the derived altitude and the reference altitude at the network

in combination with Claim 15 and any intervening claims. Fernandez-Corbaton, Okude and van Diggelen do not send weighting factor information to the network. van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Claim

21 is thus further patentably distinguished over Fernandez-Corbaton and van Diggelen.

Allowability of Claims Over Compact GPS, Nelson & van Diggelen

Summary of Examiner's Rejection

Claims 1, 15 & 19-21 stand rejected under 35 U.S.C. 103 as being unpatentably over Compact GPS in view of van Diggelen. Alternatively, Claims 1, 15 & 19-21 stand rejected under 35 U.S.C. 103 as being unpatentably over Nelson in view of van Diggelen.

The Examiner asserts for both rejections that it would have been obvious "... for the receiver to be able to access the terrain model over a network in order to reduce the amount of storage space in the receiver... and in order to provide real time altitude data...." Office Action, 14 April 2003, para. 21.

Discussion of Patentability of Independent Claim 1

Regarding Claim 1, contrary to the Examiner's assertion, van Diggelen does not disclose or suggest a "...method in a satellite positioning system receiver, comprising

> ... determining an estimated location of the receiver at the receiver;
>
> transmitting the estimated location to a network;

receiving from the network altitude information based upon the estimated location of the receiver;

determining a new location of the receiver at the receiver based upon the altitude information received from the network.

The Examiner's rejections are both based on the erroneous conclusions that van Diggelen discloses transmitting estimated location form the GPS receiver to the network. As note previously, van Diggelen doe not transmit estimated location to a network. In FIGs. 8 & 9, van Diggelen discloses transmitting only pseudorange information to a reference station, which performs position computation. van Diggelen, col. 7, lines 55-63 & col. 8, lines 5-13. There is no indication that the GPS receiver of Nelson or Compact GPS transmits estimated location to a network or receives altitude information from a network in response to sending the estimated location information. Nelson and Compact GPS disclose autonomous GPS devices. Claim 1 and the claims that depend therefrom are thus patentably distinguished over Compact GPS or Nelson in combination with van Diggelen.

Discussion of Patentability of Claim 5

Regarding Claim 5, contrary to the Examiner's assertion, Compact GPS or Nelson and van Diggelen fail to disclose or suggest "... receiving at the receiver terrain slope estimates at the estimated location from the network, determining the new location at the receiver based upon the altitude information and terrain slope estimates received from the network" in combination with the limitations of Claim 1. Van Diggelen does not obtain terrain slope information from a network. The reference station in van Diggelen provides only position fix information to the mobile receiver. van

Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Nelson and Compact GPS do not disclose receiving network assistance. Claim 5 is thus patentably distinguished over Nelson or Compact GPS in combination with van Diggelen

Discussion of Patentability of Independent Claim 15

Regarding Claim 15, contrary to the Examiner's assertion, Compact GPS or Nelson and van Diggelen do not disclose or suggest a "... satellite positioning system receiver location method, comprising

> ... determining, at the receiver, an estimated location of the receiver;
> transmitting the estimated location of the receiver to a network;
> determining a reference altitude of the receiver at the network based upon the estimated location of the receiver;
> determining a new location of the receiver based upon the reference altitude of the receiver.

van Diggelen transmits only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. van Diggelen does not transmit an estimated location from the mobile device to the network. The Examiner does not rely on Fernandez-Corbaton to meet the limitations of Claim 15. Neither Compact GPS nor Nelson discloses communication with a network. Claim 15 and the claims that depend therefrom are thus patentably distinguished over Compact GPS or Nelson in combination with van Diggelen.

Discussion of Patentability of Claim 19

Regarding Claim 19, contrary to the Examiner's assertion, Compact GPS or Nelson and van Diggelen fails to disclose or suggest determining "... determining the new location of the receiver at the network" in combination with Claim 15 and any intervening claims. Claim 19 depends from Claim 18, which the Examiner has not rejected based on Compact GPS or Nelson and van Diggelen. Claim 18 recites that a location determination is made only if a difference between coarse and the reference altitude satisfies a condition. Nelson, Compact GPS and van Diggelen do not compute such a difference. Claims 18-19 are thus further patentably distinguished over Compact GPS or Nelson in combination with van Diggelen.

Discussion of Patentability of Claim 20

Regarding Claim 20, contrary to the Examiner's assertion, Compact GPS of Nelson and van Diggelen fail to disclose or suggest determining

> ... the estimated location is a 3-dimensional location fix, determining a derived altitude from the estimated location,
>
> transmitting satellite information used to determine the 3-dimensional location fix of the receiver to the network, determining a difference between the derived altitude and the reference altitude, determining a corrected location of the receiver based upon the satellite information and the difference

in combination with Claim 15. Compact GPS, Nelson and van Diggelen do not send a 3 dimensional location fix to the network. Van Diggelen sends only

pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. The Compact GPS and Nelson do not communicate with a network. Claim 20 is thus further patentably distinguished over Compact GPS or Nelson in combination with van Diggelen.

Discussion of Patentability of Claim 21

Regarding Claim 21, contrary to the Examiner's assertion, Compact GPS or Nelson and van Diggelen fails to disclose or suggest determining

> ... transmitting weighting factors used to determine the estimated location of the receiver to the network, determining a corrected location of the receiver based upon the satellite information, the weighting factors, and the difference between the derived altitude and the reference altitude at the network

in combination with Claim 15 and any intervening claims. Compact GPS, Nelson and van Diggelen do not send weighting factor information to the network. Van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. The Compact GPS and Nelson do not communicate with a network. Claim 21 is thus further patentably distinguished over Fernandez-Corbaton and van Diggelen.

Allowability of Claims Over Odagawa & van Diggelen

Summary of Examiner's Rejection

Claims 1-5 & 16-21 stand rejected under 35 U.S.C. 103(a) as being unpatentably over Okude in view of van Diggelen.

The Examiner's asserts that van Diggelen discloses transmitting estimated location form the GPS receiver to the network, and the Examiner concludes that it would have been obvious "... for the receiver to be able to access the terrain model over a network in order to reduce the amount of storage space in the receiver... and in order to provide real time altitude data...." Office Action, 14 April 2003, para. 24.

Discussion of Patentability of Independent Claim 1

Regarding Claim 1, contrary to the Examiner's assertion, Odagawa and van Diggelen do not disclose or suggest a "...method in a satellite positioning system receiver, comprising

> ... determining an estimated location of the receiver at the receiver;
> transmitting the estimated location to a network;
> receiving from the network altitude information based upon the estimated location of the receiver;
> determining a new location of the receiver at the receiver based upon the altitude information received from the network.

The Examiner's rejection is based on the erroneous conclusions that van Diggelen discloses transmitting estimated location form the GPS receiver to the network. As noted above, van Diggelen does not transmit estimated location to a network. In FIGs. 8 & 9, van Diggelen discloses transmitting only pseudorange information to a reference station, which

performs position computation. van Diggelen, col. 7, lines 55-63 & col. 8, lines 5-13. Odagawa does not communicate with a network. Claim 1 and the claims that depend therefrom are thus patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 2

Regarding Claim 2, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... determining the estimated location of the receiver based upon a coarse altitude of the receiver" in combination with Claim 1. Claim 2 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 3

Regarding Claim 3, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... determining a derived altitude based upon the estimated location of the receiver, the altitude information from the network including a reference altitude, determining the new location of the receiver if a difference between the derived and reference altitudes is outside an altitude threshold" in combination with Claim 1. van Diggelen does not receive altitude information form the network, only the location fix. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Odagawa does not communicate with a network. Claim 3 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 4

Regarding Claim 4, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... requesting and receiving the coarse altitude from the network" in combination with Claim 1. van Diggelen does not receive altitude information form the network. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Odagawa does not communicate with a network. Claim 4 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 5

Regarding Claim 5, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... receiving at the receiver terrain slope estimates at the estimated location from the network, determining the new location at the receiver based upon the altitude information and terrain slope estimates received from the network" in combination with the limitations of Claim 1. Van Diggelen does not obtain terrain slope information from a network. The reference station in van Diggelen provides only position fix information to the mobile receiver. van Diggelen, col. 7, lines 64-66 & col. 8, lines 13-15. Odagawa does not communicate with a network. Claim 5 is thus patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 16

Regarding Claim 16, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest determining "... the reference altitude of the receiver by using the estimated location to index the reference altitude of the receiver in a map database on the network" in combination with Claim 15. van Diggelen does not index a reference altitude. Instead, van Diggelen computes an average based upon a range having on altitudes above and below the earth's surface. Odagawa does not communicate with a network. Claim 16 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 17

Regarding Claim 17, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... determining the estimated location of the receiver based upon a coarse altitude of the receiver" in combination with Claim 15. Claim 17 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 18

Regarding Claim 18, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest "... determining the new location of the receiver only if a difference between the coarse and reference altitudes is outside an altitude threshold" in combination with Claim 15.

Odagawa compares the distance between intersecting roads and an estimated position. Claim 18 is thus further patentably distinguished over Odagawa and van Diggelen.

Discussion of Patentability of Claim 19

Regarding Claim 19, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest determining "... determining the new location of the receiver at the network" in combination with Claim 15 and any intervening claims. Odagawa and van Diggelen do not compute such a difference. Also, Odagawa does not communicate with a network. Claim 19 is thus further patentably distinguished over Odagawa in combination with van Diggelen.

Discussion of Patentability of Claim 20

Regarding Claim 20, contrary to the Examiner's assertion, Odagawa and van Diggelen fail to disclose or suggest determining

> ... the estimated location is a 3-dimensional location fix, determining a derived altitude from the estimated location,
> transmitting satellite information used to determine the 3-dimensional location fix of the receiver to the network, determining a difference between the derived altitude and the reference altitude, determining a corrected location of the receiver based upon the satellite information and the difference

in combination with Claim 15. Odagawa and van Diggelen do not send a 3 dimensional location fix to the network. Van Diggelen sends only

pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Odagawa does not communicate with a network. Claim 20 is thus further patentably distinguished over Odagawa in combination with van Diggelen.

Discussion of Patentability of Claim 21

Regarding Claim 21, contrary to the Examiner's assertion, Odagawa and van Diggelen fails to disclose or suggest determining

> ... transmitting weighting factors used to determine the estimated location of the receiver to the network, determining a corrected location of the receiver based upon the satellite information, the weighting factors, and the difference between the derived altitude and the reference altitude at the network

in combination with Claim 15 and any intervening claims. Odagawa and van Diggelen do not send weighting factor information to the network. Van Diggelen sends only pseudorange information to a reference receiver. van Diggelen, col. 7, lines 57-67 & col. 8, lines 5-16. Odagawa does not communicate with a network. Claim 21 is thus further patentably distinguished over Odagawa and van Diggelen.

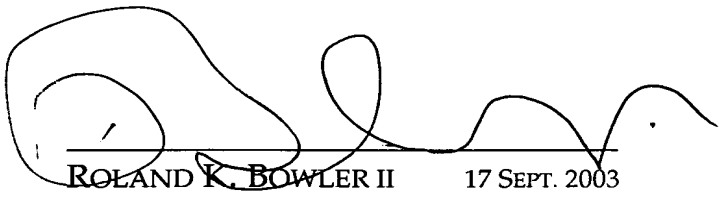
Prayer For Relief

In view of the amendments and the discussion above, the Claims of the present application are in condition for allowance. Kindly withdraw any

rejections and objections and allow this application to issue as a United States Patent without further delay.

A telephone interview with the Examiner is requested. Kindly contact the undersigned upon carefully reviewing the foregoing amendment and discussion, prior to preparing an official action in response thereto.

Respectfully submitted,



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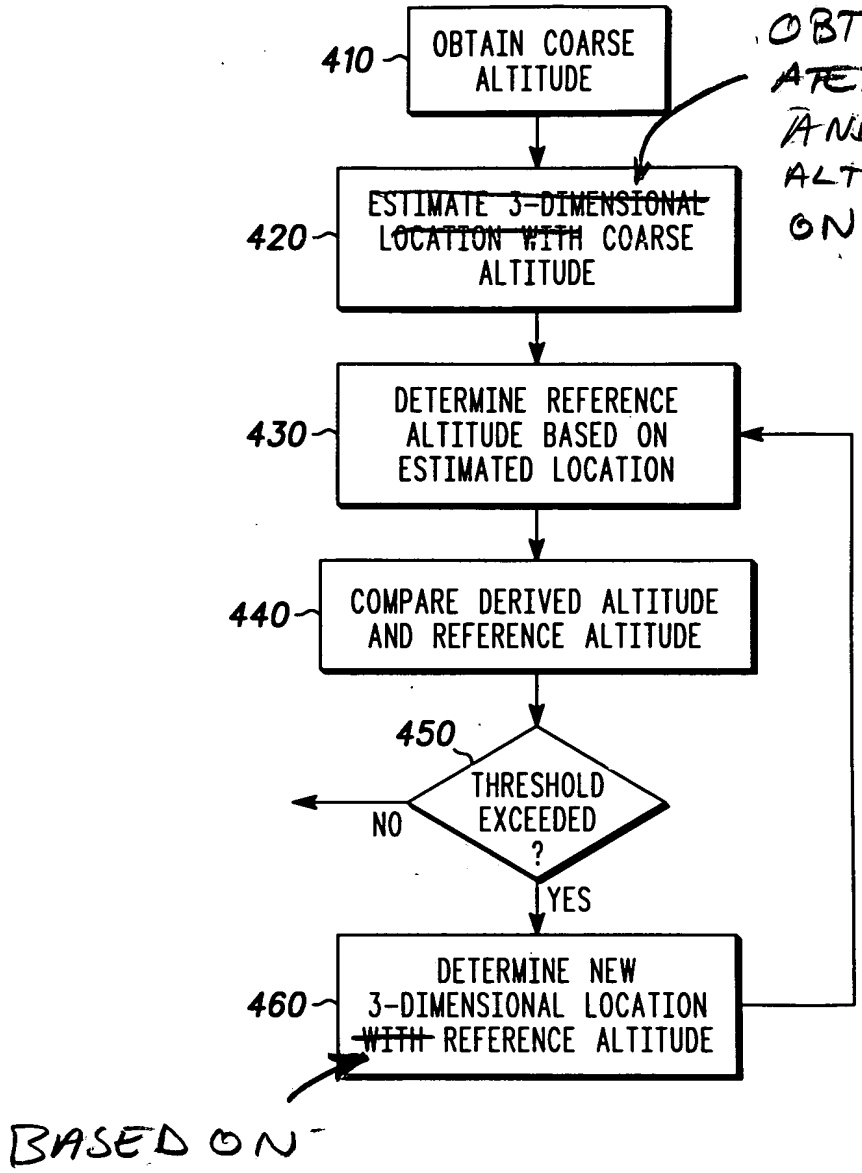

OBTAIN AN ESTIMATED ALTITUDE AND A DERIVED ALTITUDE BASED ON

BASED ON

Approved
FHM
10-14-03

FIG.4